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These crops do not exhaust their agriculture. Wheat and barley are grown, but not in significant quantities. Varieties of beans other than the soybean are important. Pumpkins and gourds of various kinds make valuable food supplements. The onion, the carrot, and the giant horse radish are grown for home use, occasionally for sale. More unusual products, such as the taro, are grown less frequently and then only for side dishes at meals.

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In their agricultural work, farmers prefer the lunar (kyūreki, literally, old calendar) to the western, solar (seireki) calendar. The lunar calendar was abolished for official purposes by the Japanese in 1874. While this change was introduced into Okinawa, the lunar calendar still has vitality in the countryside. The present published calendars show with a large numeral the day in the western count, but in each block, in smaller script, is the corresponding lunar date:

JANUARY	1952
1	
12th Month	5th day

Births, deaths, official correspondence are recorded in the western count. The farmer, however, thinks in terms of the lunar calendar. When he says he plants his sweet potatoes in May, he means May by the lunar count.

805

Western Solar and Lunar Day Equivalents

Western	Lunar Count	
	1951, Year of the Hare	1952, Year of the Dragon
Jan 1	Nov 24	Dec 5
Feb 1	Dec 25	Jan 6
Mar 1	Jan 24	Feb 6
Apr 1	Feb 25	Mar 7
May 1	Mar 26	Apr 8
Jun 1	Apr 27	May 9*
Jul 1	May 27	May 10*
Aug 1	Jun 29	Jun 11
Sept 1	Aug 1	Jul 12
Oct 1	Sep 1	Aug 13
Nov 1	Oct 3	Sep 14
Dec 1	Nov 3	Oct 15

* The period from May 24 to June 21, 1952, western calendar, corresponds to the lunar May 1 to May 29. The fifth month is then repeated beginning June 22 and ending July 21, western count. This intercalary month is necessary because the lunar year is about 355 days long. As a consequence about 11 days are lost each year, and an additional month is required every third year.

221
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Some young farmers are now breaking away from the traditional lunar month and using the western calendar in describing their annual activities.[1]

The use of the lunar month is not confined to farmers. Fishermen, describing their work year, speak in terms of lunar months. For this reason, it is essential in talking to farmers or fishermen to establish at the outset what reckoning they are using. The names of the lunar month and the western month are identical. Following the Chinese, there are no distinctive names for the months. They are numbered from one to twelve. The months have to be distinguished by saying, for example, "sixth month, old calendar," or sixth month, Western calendar." [177]

An interesting minor detail of agriculture and the timekeeping connected with it is the reliance of Okinawan farmers on Japanese almanacs. These are printed and may be purchased throughout the island. One of these printed almanacs is in almost every house, or is readily available from a neighbor. Often, if one asks what is planted or harvested in any particular month, the farmer reaches for his almanac and produces the desired information. If the inquirer is not careful, he will obtain not what a farmer does during the year but what the almanac says he does.

2

Methods and Tools

132
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In the chapter on general geography, it was pointed out that, despite a high annual rainfall and precipitation every month of the year, there is a problem of water shortage and of drought. This is especially serious in the summer months in all three communities.

[Text Continues Top of P. 167--Analyst]

1 The 24 seasons, borrowed from the 24 Chinese solar terms, into which the lunar year is divided, are also retained on the modern calendar, largely for the use of farmers. For example, Shōkan (Little Cold) begins about Jan 6, Chūkei (Insects Awaken) on March 6, Bōshu (Grain in Ear) on June 5, Ritto (Beginning of winter) on Nov. 7. These 24 seasons, in my experience, are not used much. Farmers think more in terms of the four seasons instead of the 24 little seasons. In Okinawa, they must be revised mentally to suit the humid subtropical climate. "Light snow," and "Heavy snow" are inapplicable in Okinawa; they would simply be small seasons in which one would expect the greatest severity of winter. For a list of the small seasons with Chinese characters, see The five thousand character dictionary, 5th ed., with additions and revisions by George D. Wilder and Chien Hsien Tseng. Peking, 1940, xxxi. [177]

The writers of a recent report on Okinawan economy have emphasized that the combination of generally poor soils, the rapid decomposition of organic matter in a near tropical climate, and excessive leaching make the problem of fertilization very difficult--[4] to say nothing of the trace elements.

(6) Other substances are used for fertilizers. In Matsuda the barber gathers the cuttings from the luxuriant hair of his clients and places them around his sugar cane--and recommends them highly. Acacia leaves are also used for this purpose here. Leaves and miscellaneous plants are often considered to be especially good fertilizers.

Crop rotation (rinsaku) practices differ by district. In the Hanashiro area, the sugar cane, soy bean, and sweet potato (or vegetable), sugar cane rotation is common. Rotation of paddy with another crop does not occur. Rice succeeds rice in the double cropping system here. In Matsuda, a common rotation is either (1) the sweet potato, soy beans (or grain, millet, or green peas) and the sweet potato, or (2) the soy bean, sweet potato, grain (barley or millet) rotation. Here rice is not rotated with other crops. (This however does occur in Okinawa).

Simple Rotations
Hanashiro and Nagamo

One Year

After the sweet potato harvest, the plot is planted in soybeans in the first lunar month.

The soybeans are harvested in the fifth lunar month.

Sweet potatoes follow the soybeans in the sixth lunar month

or

Vegetables alternating with the sweet potato for a year.

Two Years

Sugar cane is sown in the sixth lunar month.

Harvested two years hence, followed by ordinary beans or vegetables, again followed by cane.

4 Agricultural and economic reconstruction in the Ryukyus. A report. Agricultural mission to the Ryukyus, Nov. 1949, 46-47.

1: Glacken E-5 (1951-1952) 1953 AC7 Okinawa AC7

242
221
[423]

These illustrations, while suggesting the common practice, are oversimplified. Rotation is more complicated because all of a farmer's scattered holdings may be involved in an overall rotation, and one plot may serve several different purposes. In the following example of a plot divided up into five small parcels, the planting and transplanting of the sweet potato is part of the mechanism of rotation:

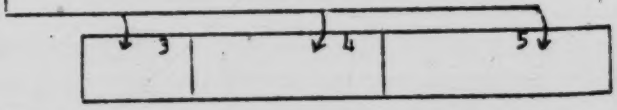
Time: September 1951

Newly hoed. To be planted in beans (sora-mame), Sept. 1951. 1	Planted in Sweet Potatoes in July 1951. To be harvested in Jan. 2	Soy beans harvested in May Now in weeds and grass 3	Now being freshly planted with slips from Parcel 4. Hoeing Completed.
Planted in Sweet Potatoes on Sept. 20, 1951. Slips from this parcel are vegetatively reproduced on parcels 3 & 5. → 4			5

In the following illustration, sweet potatoes and beans provide rotation both of crop and of field:

1 Sweet Potato Seed Bed	Planted in Soybeans 2 in January. Harvested in May. Sweet potato cuttings planted after the soy bean harvest. The plot is entirely in sweet potatoes by May.
Potatoes planted in Feb. May and July cuttings supply 2, 3, 4, 5	

Planted With Sweet Potato Slips or Clones:



A crop rotation with sugar cane depends on whether it is a spring (harue) or a summer (natsue). In the spring planting, lunar calendar:

> Sugar cane cuttings are planted in the second month, to be harvested one year later. At that harvest, the plants are not torn out, but the stubs are allowed to sprout (the stubble or ratoon crop), the

242
227

resulting growth being harvested in the second or third lunar month one year hence. After this second cane harvest, the plant is torn up and soy beans or sweet potatoes are grown. This is a two year period for the cane, followed by one year in vegetables or other crops.

In the summer planting, lunar calendar:

Cane cuttings are planted in the seventh month. This crop is harvested about a year and a half later, in the twelfth lunar month of the following year, then to be planted in soy beans or sweet potatoes.

In Matsuda, crop rotation is confined to crops other than rice. The rotation, as in the south, centers around the sweet potato, sugar cane, vegetables and grains. The rotation in a parcel of land may be the sweet potato, then the soy bean, green peas, or a grain such as barley, wheat, or millet, followed by the sweet potato. In this rotation, small segments of land are reserved for sweet potato seed beds. When they are not used for this purpose, they may be left fallow for about three months of the year. The following diagram shows the same plot of land at three different times of the year:

Phase #1, 1-5 Month Phase #2, 5-9 Month Phase #3, 10-12th Month

In phase 1, the plot is planted to soy beans. A small corner of this plot (A), is devoted to a sweet potato bed. After the soy beans are harvested, slips from the plants in the sweet potato bed are transplanted and the whole parcel is in sweet potatoes. After the sweet potato harvest, the plot is put in a grain, perhaps millet, or barley, leaving a small plot to be hoed and prepared with composts, manures, or plant residues for another sweet potato bed.

Sugar cane is used in Matsuda crop rotations in two ways:

Rotation #1, Matsuda

First year, 2nd month	Spring growth cane slips, often the ratoon crop)
11th month	Harvest sugar cane, plant soy beans
Second year, 4th month	Harvest soy beans, plant sweet potatoes
9th month	Harvest sweet potato, plant grain or vegetables.

242
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Rotation #2, Matsuiz

First year, ninth month: Autumn planting of sugar cane
Second year, twelfth month: Harvest of sugar cane. Followed by: Soy bean, sweet potato, or vegetables.

311
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Land is seldom allowed to lie fallow intentionally for any length of time. At any one time of the year, a farmer may have idle land for which there may be a variety of reasons. He may have other tasks and be unable to cultivate all his land, or have no need of doing so, or some of his land may be so poor that he will not cultivate it unless necessary. Much depends on the individual farmer and his holdings. The village records indicate that in Hanashiro 97.2% of the rice and 83.1% of the dry crop land is under cultivation. From the preceding discussion of land classification, it is clear that many parcels are of marginal quality, and these areas may be left uncultivated, at least part of the year. During the post-war [426] period there has been some informal lending of land, free of rent, to friends and neighbors, if the farmer is not using it himself.

241
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Manual labor with hand tools is the dominant method of cultivation. Domestic animals are not uncommon, but their use in farming is minor. The war increased the dependence on manual labor through the loss of domestic animals. Only cattle are now used in rice cultivation for plowing and harrowing and this is infrequent. The man or woman and the hoe are far more common. Crops are carried from the [482] fields by human labor. The basket or the straw container, or the [415] tied rice sheaves on either end of a pole over the shoulder, and not [493] horse carts, push carts, or wheel barrows are the main means of transport from field to courtyard. The barefooted farmer, with his hoe and a pole or a basket does the greatest part of the work. The common tools of agriculture are hand tools and adapted to the intensive cultivation which so often has more properly been called the work of a gardener rather than that of a farmer.

412

The basic all purpose tool is the solid bladed hoe. The hoe, since deep cuts are possible with its heavy blade, takes the place of the plow. The hoe also replaces the spade, and even the rake, for it can be used to break up and smooth the soil. A poorer farmer may lack [434] many of the tools in the following list, but he will have two or three of the solid bladed hoes.

The accompanying illustration shows the most common agricultural tools:

1. The hera, a spatula or trowel, used for transplanting tops of the sweet potato. Its wooden hand grip curves toward the end of the tool. The hera is also used as a scraper to remove brown sugar from the sides of the cooking pans during the sugar making season.

2. The kama, a small sickle. Next to the hoe, it is the most

common and indispensable tool. It has many uses, including cutting rice stalks at harvest, brush, and sweet potato tops. 412

3. A small sharp pointed hoe, with a short handle, used in sweet potato planting.

4. A two pronged hoe, the futamata, used mostly with sweet potatoes. The two pronged hoe is used in softer soils. It is much more common in Matsuda than in the southern villages.

5. The three pronged hoe, the mutsumata, also used in sweet potato cultivation and in digging. These prongs, with skilful use, do not cut the potato. It is also much more common in Matsuda than in Hanashiro or Nagamo.

6. The common all purpose hoe (kuwa). It has a thick, solid, wide blade. The handle (about 3 1/2 feet long) is stout. The hoe is much sturdier than the ordinary American garden hoe.

7. Another hoe, longer and with a sharper angle between the handle and the blade. It has a variety of uses.

8. A long handled hoe with a heart shaped blade. It is used for making furrows.

9. An ordinary rake.

10. A cultivator and weeding tool for rice paddies. (The pole in back near the handle of the pitchfork is a prop to hold the tool upright for the picture). Only the more prosperous farmers possess this tool. Rice weeding is done almost entirely by hand. [934]

11. An ordinary pitchfork.

12. The plow (suki) 407

13. The harrow (maguwa), and

14. The waku, a hexagonal wooden frame used in laying out a rice field for transplanting. 413 The last three tools or devices, which are not shown in the picture, will be described under rice cultivation.

3

The Annual Work Cycle

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The following charts show the annual work cycle by lunar month of two farmers, one in Hanashiro, one in Matsuda. The Western calendar equivalents for 1951-52 are shown below the lunar month. Because the lunar year is shorter, there is a gap, as the period actually covered is from February 6, 1951 to January 26, 1952. These materials are based on observation and conversation with the farmers concerned.

241
241

Planting dates, types of crops vary slightly from farmer to farmer, even in the same area, depending on individual caprice, the nature of the land, and the types of crops the farmer prefers.

ANNUAL AGRICULTURAL ACTIVITIES
of
TWO REPRESENTATIVE FARMERS OF HANASHIRO AND HATSUDA
By Lunar Month

HANASHIRO	HATSUDA
FIRST MONTH (Feb 6-Mar 7)	
Work begins on 3d day. On 4th and fifth day plant soy beans. Planting may continue next month. Make Sugar. Transplant rice from seeds sown in seed bed in 11th month. Weeding of soy beans.	Work day begins 3d day after New Years. From 4th or 5th until 20-25th prepare soil for soy beans. Sow rice in seed bed. Make sugar in leisure hours.
SECOND MONTH (Mar 8-Apr 5)	
Soy bean planting continues if necessary. Sugar making continues. Planting of sweet potatoes, using slips or tops of plants. Plant cucumbers, Chinese lettuce (hakusai) Sow sugar cane cuttings, slant-wise or part out of the ground. Harvest small patch of Irish potatoes.	Soy bean planting stops about middle of the month. Transplanting of rice from seed bed begins. Weeding and care of soy beans.
THIRD MONTH (Apr 6-May 5)	
In the main, a continuation of second month activities. Planting sweet potato bed. Spring planting of sugar cane continues. Weed rice field by hand.	Plant the sweet potato in seed bed for future slips. Planting season lasts until the 25th. Weed rice fields. Sowing of sugar cane horizontal plant--about middle of the month.
FOURTH MONTH (May 6-June 4)	
Spring planting of sugar cane continues. Usually finished early part of this month. Continue weeding rice fields. Sow a little dasheen, the satoimo, like taro.	Weeding of rice fields completed about middle of the month. After rain, sow sweet potato, through the 5th month. Sown by slips or transplants. Finishing up weeding of rice plants.

HANASHIRO	HATSUDA
FIFTH MONTH (June 5-July 3)	
This and succeeding month the busiest of the year. Harvesting and threshing of soy beans. Plant sweet potato slips.	Busiest month continuing through the sixth month. Soy bean harvest. Plots formerly occupied by soy beans put in sweet potato slips which were sown in the 4th month. Heaviest sweet potato planting of the year.
SIXTH MONTH (July 4-Aug 2)	
This and the previous month the busiest time of the year. Continue with soy bean harvest if required. Harvest of red beans, kidney beans (ingenmame). Plant sweet potato slips. Beginning of summer planting of sugar cane which continues until the 8th month. The rice harvest. Rice threshing. Begin digging up the wet and drained fields. Beginning of transplanting preparations.	This and the previous month the busiest time of the year. Sweet potato planting. Rice harvest begins about 10th of the month. Rice threshing with the treadle thresher (dakkoki). Rice land with cropped plants turned under. From 10-20th preoccupation with rice. Replanting of rice seed beds after testing. From 20th to 30th rice planting. Other rice lands fertilized, prepared for transplants. Beginning of transplanting.
SEVENTH MONTH (Aug 3-31)	
Planting of rice in the seed bed. Beginning of transplanting of rice shoots from seed bed (about 20 days for growth). Continues through 8th month.	Transplanting rice continues until the 10th. Plant sugar cane. Plant sugar cane slips if there is rain. Begin weeding rice fields about the 10th.
EIGHTH MONTH (Sep 1-30)	
Plant onions, tomatoes, carrots, lettuce. Plant wheat (komugi), barley (Omugi), and naked barley (hadaka mugi). Plant sweet potato slips. Continue and complete the rice transplanting. Begin weeding the rice plants.	Rice field weeding continues. Done three times in three weeks until about the 15th. Plant sweet potato slips if sufficient rain.
NINTH MONTH (Oct 1-29)	
Sow horse beans (sora-mame) and barley	If rain, sow sweet potato slips, sow wheat, radishes, tomatoes, leafy vegetables (ha no yasai) and Chinese cabbage (hakusai)

1: Glacken E-5 (1951-1952) 1953 AC7 Okinawa AC7

HANASHIRO	MATSUDA
TENTH MONTH (Oct 30-Nov 28)	
Possible beginning of second rice harvest, though this is early. Planting rice in seed bed. Sow sweet potato slips.	Sow peas (endō-mame) and beans. Plant sweet potato slips if rain. Sow giant radish (daikon), tomatoes, barley. Weeding of radishes, and vegetables planted previous month until the 25th. Rice cutting begins.
ELEVENTH MONTH (Nov 29-Dec 27)	
Continuation of the rice harvest. Threshing and milling. Planting of sugar cane, slantwise. Sow cabbage seed. Rice seed planting begins, or continues if begun in the 10th month.	Rice cutting and harvest. Threshing and milling. Rice fields dug up. Preparation of new fields.
TWELFTH MONTH (Dec 28-Jan 26)	
Sugar making. Sow Irish potatoes (bareisho) but in small quantities	Continue digging up rice fields. Rice sown in seed beds after seed testing. Sugar making may begin.

YEAR ROUND ACTIVITIES

Sweet Potato Planting, Transplanting and Harvesting continues throughout the year, depending on time and distribution of rainfall.

4

Rice Cultivation

Growing rice is a most exacting task. The period from the time the seed bed is prepared until the final milling is one of tedious work and continuous apprehension. The reaction of Okinawan farmers to rice cultivation perhaps was best summed up by a Matsuda farmer who said, "Everyone dislikes the work, but rice is delicious."

Assuming that the field is already in existence, the cultivation of rice may be divided into the following stages: (1) preparation and laying out of the seed bed, (2) selection of the seed, (3) transplanting

243 inches high, the bottom of the paddy becomes a tangled mass. Farmers walk disconsolately away from a field like this, often without even attempting to harvest the crop. The seeds once soaked will produce inferior rice. In this case, the farmer may turn the whole crop under or salvage some for pig food. The growing of rice is one long gamble with the wind and with typhoons, and there is seldom a year in which some rice is not destroyed.

[221] The harvest. The cutting of rice at harvest time, July and November in the western calendar, is done in a uniform manner. (Harvest times may vary somewhat from place to place). A bunch of the long stalks is grasped in one hand and cut off with the small sickle. A stubble of a few inches is left in the field. The sheaves are tied up with a piece of rice straw and thrown in piles. The commonest and [482] most convenient way of carrying the sheaves from the field is to tie several together. A large bundle of these is carried on either end of a pole which rests on the shoulder. The ends of the pole are cut like tenons and stuck in the bundles below the binding. The rice is carried to the courtyard to be threshed. If necessary, it will be allowed to dry for a few days.

243 Threshing, hulling, and milling. Rice is threshed either in the
407 courtyard of the home or in a flat place near the house. During rice harvest, the threshing machines can be heard all over the village, the noise suggesting the sounds of cars on a railroad track, heard from a distance. The device now universally used for threshing rice is the dakkoki.

This has a foot treadle, similar to an old fashioned sewing machine. Working the treadle up and down causes a drum, set at about waist length, to revolve. This drum has a series of wires set in rows and bent over, appearing like large staples. These staples are parallel with the line of rotation of the drum.

A conveniently handled bunch of stalks (wara) is held on the revolving drum, the rice seeds touch the staples, which knock the kernels off. They drop to the floor of the device. Often the top has a canvas cover to catch the flying rice kernels and the machines is set in the middle of a large piece of canvas so that the grain can easily be re- [467] covered. Both men and women do this work, although women seem to do more of it. They are free to work while at home, alternating the task with other chores. They keep up with the man and the elder children who are carrying the rice bundles in from the fields. After threshing, rice straw is thrown aside. It has many subsequent uses.

[177] The dakkoki, an introduction from Japan, is new in Okinawa. In Hanashiro it has been used scarcely 15 years. Prior to this, more primitive methods were used which can still be observed in Matsuda today. These old methods are no longer important, but they are of interest because they were used, instead of the treadle thresher, up to pre-war times.

In addition to these varieties, cultivated locally, imported rice is distributed through the import stores. These rices generally are from Egypt, Siam, and Burma. They are not well liked and are considered to be tough (katai). Whether this is because the variety itself is disliked or because the imports were of a poor quality is hard to say, but Egyptian, Siamese, and Burmese rice are unfavorably compared with Japanese, Formosan, or the locally grown products. Okinawans are very sensitive to the types of rice. There is no such thing as "rice." Long habituation and fondness for special kinds have induced tastes and preferences which each villager is quick to express.

In Hanashiro, the main type of rice planted is also the Taichu 65, a variety which originated in Formosa, and is generally preferred. The red variety, mochigome, does not do well here, according to local farmers, and just a little is grown. Mochigome (literally, rice-cake rice) is used in making the doughy and gummy rice cakes.

5

The Sweet Potato

The cultivation of the sweet potato (satsuma imo) is a much simpler undertaking than rice culture. Fields are prepared by hand hoeing. The plow and the harrow are not used. In sweet potato cultivation, seed potatoes are first planted in a small plot. This furnishes slips or transplants for other fields. Slips are multiplied by using the tops of one field to plant another. Propagation thus is by clones, and this vegetatively reproduced plant is the mainstay of the diet.

The potato seed bed, well hoed and fertilized, is generally planted in the spring. The tops to be used as slips (kazura) are cut off and planted in rows. Practice has brought deftness in this transplanting. A small amount of soil is lifted up by the spatula, (hera), and held so that an opening rather than a hole appears. The slip is shoved into the aperture and quickly pressed down by the left heel, as the farmer moves to the next planting.[5] Few tools are used in the cultivation of the sweet potato. Only the hoe and the spatula are really needed. Occasionally one finds a special hoe with a sharp angle between the blade and handle or a heart shaped hoe with a long handle. In the Hanashiro and Nagamo areas, the solid bladed hoe is the commonest tool. Two and three pronged hoes are less often used because of the hardness of the soil.

The cultivation of the sweet potato, as we have said, is a year round operation, though planting may slacken off during the winter months.

5 Methods of cultivation have changed little in the past 100 years. The same operation is described in Hawks, Perry's expedition to Japan, II, 31-32.

In Matsuda, the stalk is cut up with a large knife. In Nagano and Hanashiro, the oshikiriba (literally, push-cut-machine) is common. This is a device with a fixed blade, curving upward, on a stand. The cane is laid on the top of the blade. The handle is pressed down, forcing the cane stalk through the stationary blade. The use of this device is not universal. In the north, the hand cutting machine was a casualty of the war. 249 184

It is worth a slight digression here to add that, in considering various techniques as evidences of a departure from or adherence to traditional methods, the effects of the recent war must constantly be borne in mind. Sugar making is a good example. Primitive methods of making it today are a return, out of economic necessity, to earlier ways because of lack of capital to replace the former machinery. In Matsuda, the continued use of the horse drawn crushing rollers is not an expression of conservatism but of improvisation and return, in lieu of anything better, to old methods previously in use. Such devices as the oshikiriba are not good examples of this because it is not a decisively superior tool. A skilled farmer can cut the cane very efficiently with his knife. 178 727 249

Cane cuttings are made when the plant is about six months old and before it is mature. When year old plants are used for cuttings, only the top, or the youngest part is taken. The slip used may have two or three joints or buds. The length of the cutting apparently is determined by the number of joints. In Matsuda, slant planting seems to be favored because the plant is said to receive more water and to be able to withstand typhoons better. Flat planting is faster than slope planting. From one stalk usually five or six transplants are made. 249

There are two plantings of sugar cane, the spring (haru-ue) and the fall (akiue). Cane planted in the spring planting, from January to March, is harvested in April of the following year. In the fall planting from July to September, the cane is harvested a year from the following December. The cane of the fall planting is harvested but the stumps are allowed to sprout and grow again. Following this harvest, the whole plant is torn out and the field is replanted with slips. Though the ratoon crop could be continued longer, the general practice is to tear up the plants after the second growth. 249 221

The slips are about 8 sun (9.6 inches) long. In Hanashiro, they are generally planted flat with the exception of the slip nearest the top of the cane stalk, which is planted at about a 45° angle, the theory being that this part of the stalk has less vitality than the others. These slips are planted about 6-8 inches apart, 8-12 inches deep in rows about 4 feet apart. 249

In Hanashiro, at harvest time, the sugar cane is carried on the shoulder or by horsecart and stacked in piles outside the sugar mill. Though an effort is made to crush it immediately, cuttings may remain overnight or be stacked for a day or two outside the mill. The mill [482] [493]

824 [262] [432] [962] [494] Soy beans have three main uses: soy sauce which is seldom made in the home, bean curd (tōfu) and miso, a bean paste, both always home made. For this reason, soy beans are grown mostly for home use, with the surplus sold. In Hanashiro, where the surpluses are greater, the beans may be sold in Naha, Shuri, or Itoman. Women do the selling, taking the beans to market on the buses, trucks, or three wheeled vehicles.

241 262 (2) Other types of beans such as the red dwarf bean (azuki) (Phaseolus angularis Wight), the kidney bean (ingen in Japanese, Phaseolus vulgaris L), the broad or horse bean (soramame in Japanese, Vician fabia L), and peas (endō in Japanese, Pisum sativum L) are grown for home use, usually in parcels which are closest to the house.

[263] [252] (3) The giant radish, (daikon in Japanese, Raphanus sativus L) is, after the soy bean, the most important of the minor crops grown for home use. This is the vegetable most favored either as a condiment, or as a side dish. It is eaten sliced raw, pickled, or fried in stripe in soy sauce. When eaten boiled, its flavor resembles that of a turnip.

(5) The pumpkin (Cucurbita pepo L) called nanka or kabocha, the latter name being derived from the word Cambodia from which the pumpkin was introduced into Japan. They are harvested in summer, and one crop a year, generally for home use, is grown. If the flesh [231] becomes too ripe and turns reddish and sweet, it is not relished and the pumpkin is fed to the pigs.

(6) The cucumber (kiuri in Japanese, Cucumus sativus L) is a very minor crop. In some of the villages were they generally grown, and then only for home use.

(7) The hechima or tōgwa in Japanese, subui in Okinawan.[7] This is very large and cylindrical. In exceptional specimens, its outward appearance is indistinguishable from the water melon. Its flesh is white. In the two southern villages, the tōgwa is grown very sparingly. [184] In Matsuda and the surrounding villages, it is more common. Here it is used to fill in during times of food shortage. Some specimens I have [221] seen weighed over 100 pounds. It is planted after lunar New Years, harvested in the 6th or 7th lunar month, a period reaching from about January to May. From April to July, when other vegetables are scarce, [252] it is often used as a substitute. The flesh when boiled is rather tasteless; it is commonly boiled and served with chunks of meat. The tōgwa, in the northern villages, is often stored in dark cool places away from the sunlight, often under the house. If not cut open, the [251] melon can be saved for a year.

7 I am not certain whether this is Luffa cylindrica Roem, Luffa petola, Ser, the Luffa sponge, rag gourd, etc., whose pulp disappears when ripe to be replaced by a web of fibres.

226 461 month. The decline in opportunity is due, not to the weather, but to the scarcity of fish, which are said to move from these coastal waters during the winter season.

226 221 [434] The fishermen follow the lunar calendar. The type of fish caught is determined by the season. There is some specialisation based on age and experience. Only the skilled and relatively young can successfully make a living diving for the lobster and disengaging him from the rocks below. The most intense activity is during the summer months, and the cash earnings of the fishermen are greatest at this time.

226 821 Fishermen pay attention to the weather and to the moon. Part of their weather knowledge comes from traditional lore, part from observation, part from the modern storm warning systems. Fishermen do not go out if there are storm clouds overhead, especially if they are moving fast. The worst sign is an increase in the height of the waves, even if the weather is good. The phases of the moon are also considered. The half moon is the best, the quarter moon is good, but neither a full moon nor a moonless night is considered favorable. The exception is fishing for white cuttle fish, caught on winter moonlit nights. At present, official storm warning signals are universally observed. The red flag flying from a pole on the main street near the breakwater is enough to keep every fisherman at home. This faith in meteorology has not always existed. Even in recent years, fishermen have disregarded the warnings because of disbelief, or ignored them when storms did not appear following a previous warning.

226 Fishing in the Hinatogawa area is coastal (if we include distances up to twelve miles out) and is on a small scale. Much of the gear is improvised by the fishermen themselves. The methods are simple and effective, and the boats are small. This is not one of the most important fishing areas in Ryukyuan waters.[1]

226 868 [813] Men become fishermen by imitating their skilled elders. Knowledge of the fish and of the waters is imparted by word of mouth. The old men are the sources of the detailed knowledge of the currents and of the main fishing grounds, and this knowledge, held in the memory, is also transmitted orally. There are no maps or charts. Usually it takes a beginner about two years to become acquainted with the fishing areas, and about three years to have a working knowledge of the currents.

1 For a general discussion, see Aquatic resources of the Ryukyu Area. (U.S. Dept. of the Interior. Fish and Wildlife Service. Fishing Leaflet 333), Washington, 1949. This work has an interesting collection of maps and drawings of various types of nets. It is not concerned with particular areas in Okinawa, nor with customs connected with fishing.